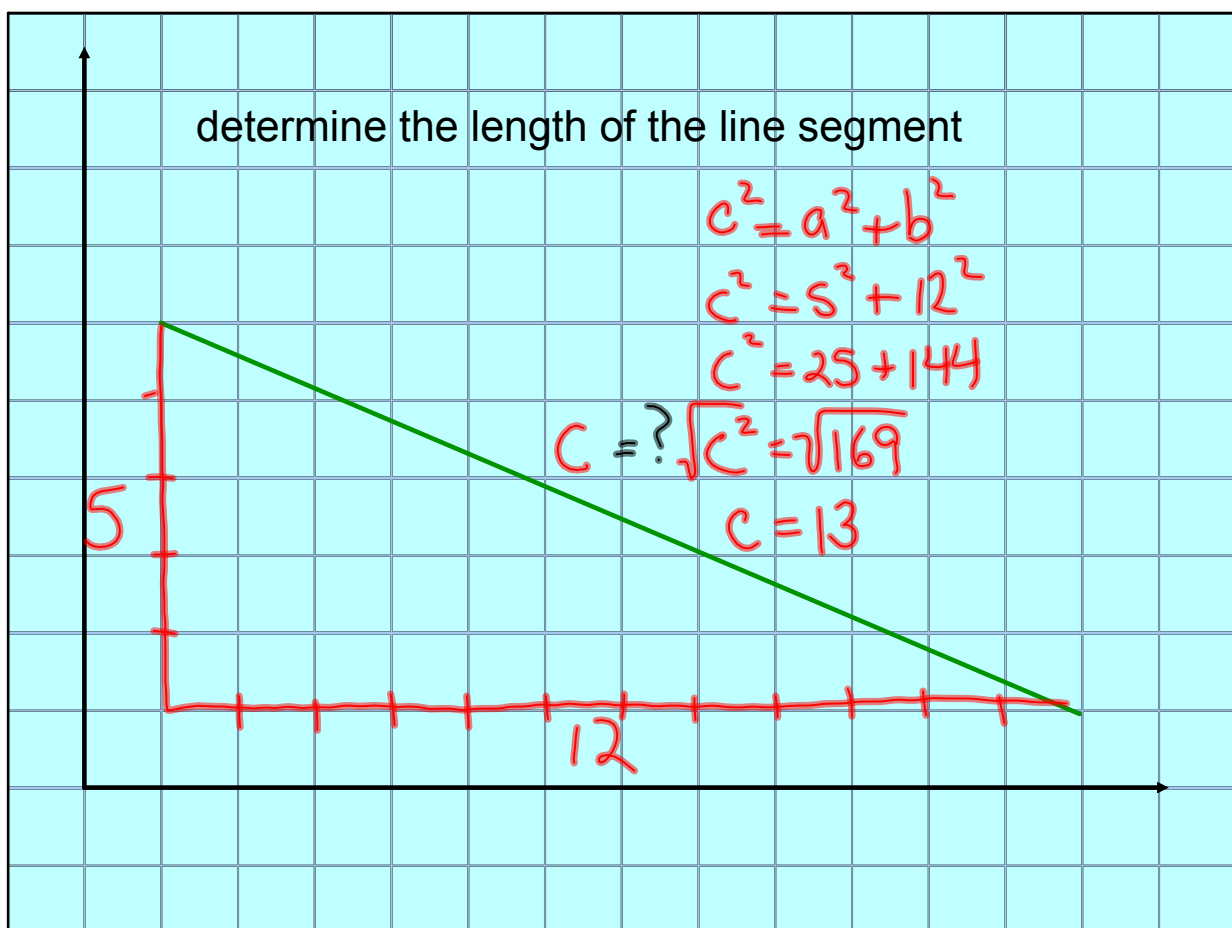


Feb 28-11:12 AM

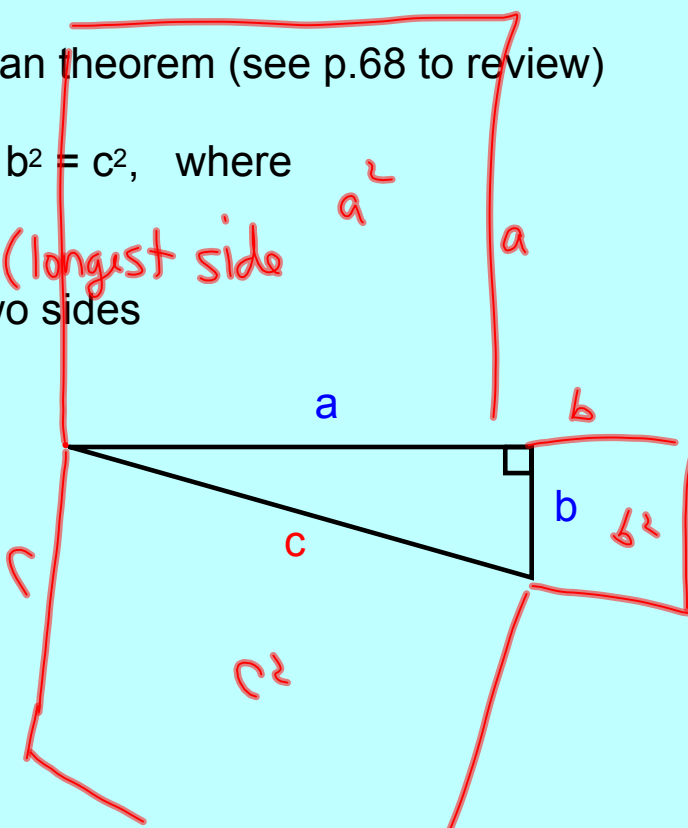
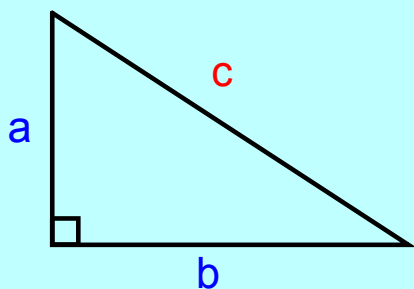


Feb 28-11:12 AM

Recall: The Pythagorean theorem (see p.68 to review)

In a right-triangle, $a^2 + b^2 = c^2$, where

c is the hypotenuse (*longest side*)
 a, b are the other two sides



Feb 28-11:32 AM

L3(2.2)-Length of a Line Segment

A line segment is a straight line between two points.
 The length of a line segment can be determined from the coordinates of the two points:

1. Connect the points with a line segment.

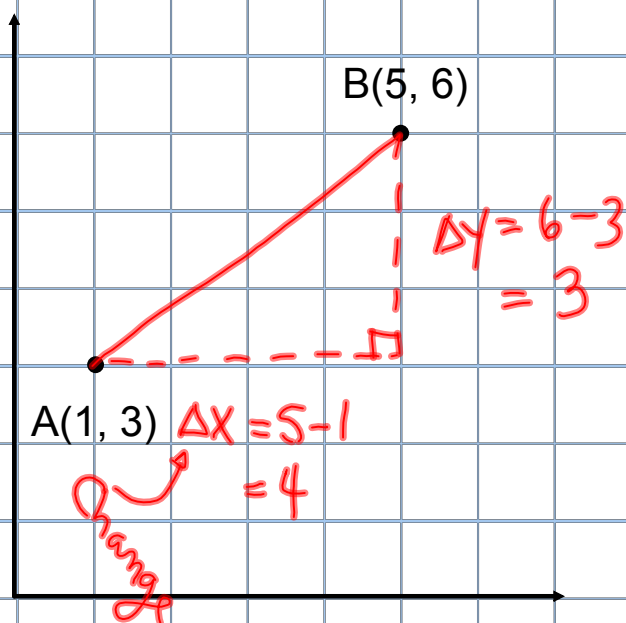


2. Construct a right-triangle, where the line segment is the hypotenuse.

3. Use the Pythagorean theorem to find the length of the line segment (hypotenuse).

Feb 28-11:11 AM

Ex.1 Determine the length of AB (d_{AB} or \overline{AB})



$$\begin{aligned} c^2 &= a^2 + b^2 \\ &= 4^2 + 3^2 \\ &= 16 + 9 \\ &= 25 \end{aligned}$$

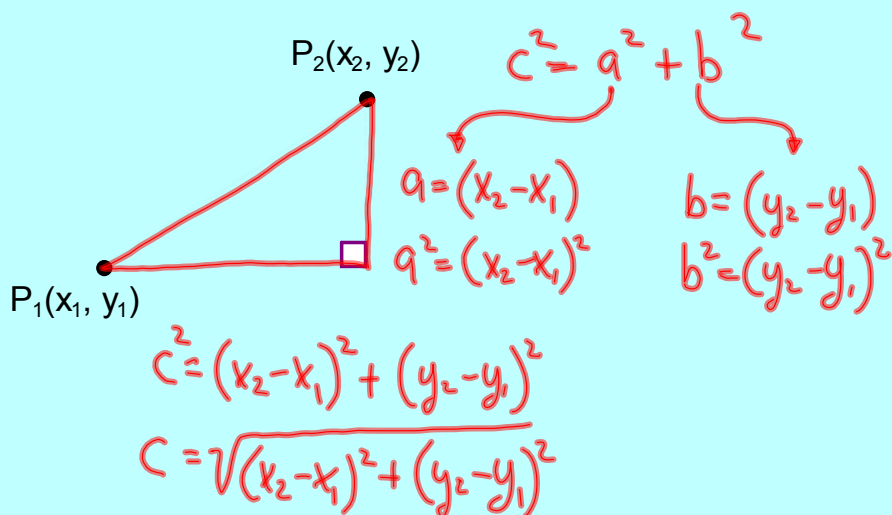
$$\sqrt{c^2} = \sqrt{25}$$

$$c = 5$$

∴ the length of AB is 5

Feb 28-11:38 AM

To derive a formula, consider two general points,
Point #1 is $P_1(x_1, y_1)$ Point #2 is $P_2(x_2, y_2)$



Therefore, the distance between any two points can be calculated using:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Feb 28-11:44 AM

Ex.2 What is the distance between the points G(-3,1) and H(4,5)? Give an exact and approximate answer rounded to the nearest tenth.

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(4 - (-3))^2 + (5 - (1))^2}$$

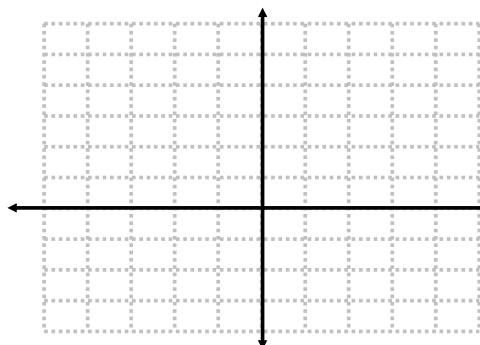
$$= \sqrt{(7)^2 + (4)^2}$$

$$= \sqrt{49 + 16}$$

$$= \sqrt{65} \quad \text{exact answer}$$

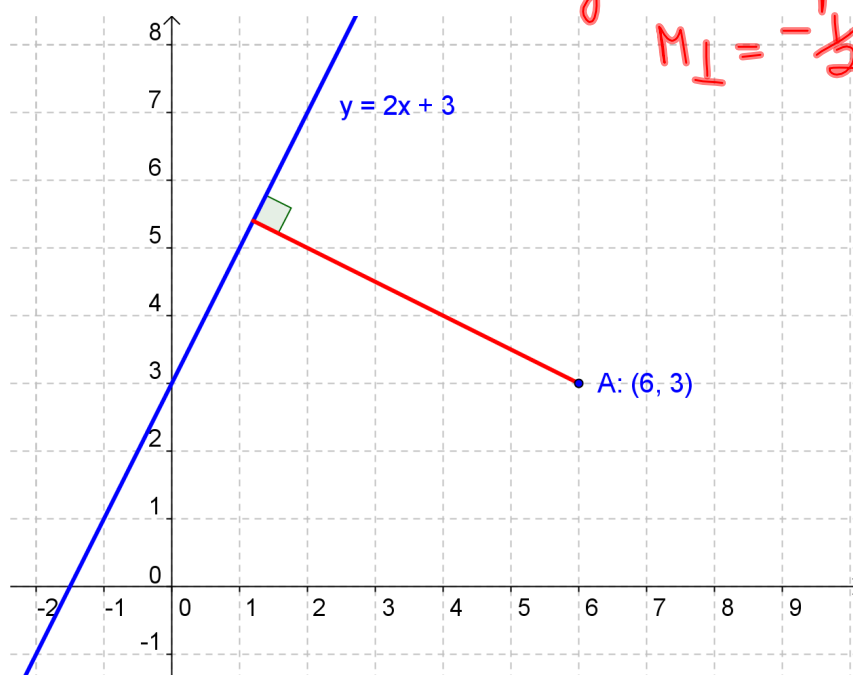
$$\approx 8.1 \quad \text{approx}$$

8.1



Feb 28-11:53 AM

To determine the distance between a point and a straight line, draw the perpendicular line through the point.



negative reciprocal
 $m_{\perp} = -\frac{1}{2}$

Oct 3-8:28 AM

Ex.3 Calculate the distance between the point $G(6, -1)$ and the line $y = 3x + 1$. Give an exact and approximate answer rounded to the nearest tenth.

$y = 3x + 1$ $m = 3$
 $b = 1$

① find $M_L = -\frac{1}{3}$
 $y = -\frac{1}{3}x + b$

② Sub $G(6, -1)$ to find b
 $y = -\frac{1}{3}x + b$
 $-1 = -\frac{1}{3}(6) + b$
 $-1 = -2 + b$
 $2 - 1 = b$
 $b = 1$

③ find POL by sub into each other
 $y = 3x + 1$
 $y = -\frac{1}{3}x + 1$
 $3x + 1 = -\frac{1}{3}x + 1$
 $3x + \frac{1}{3}x = 1 - 1$
 $3x + \frac{1}{3}x = 0$
 $x = 0$
 $y = 3(0) + 1$
 $y = 1$
 ∴ the POL is $(0, 1)$

Calculate distance between $(0, 1)$ and $(6, -1)$

$$\begin{aligned}
 d &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\
 &= \sqrt{(6 - 0)^2 + (-1 - 1)^2} \\
 &= \sqrt{(6)^2 + (-2)^2} \\
 &= \sqrt{36 + 4} \\
 &= \sqrt{40}
 \end{aligned}$$

Sep 30-4:14 PM

Assigned Work: p.86-87 # 1ac, 4cd, 6, 7(draw), 12ab, 15

Feb 28-12:00 PM